

WHAT IS CLAIMED IS:

1. A method to control hydrogen sulfide or arsine emissions or both during the processing of ore comprising adding at least one copper compound to said ore in an amount sufficient to control said emissions.

5 2. The method of claim 1, wherein said at least one copper compound is CuO or CuSO₄ or both.

3. The method of claim 1, wherein said at least one copper compound is copper oxide.

4. The method of claim 1, wherein said ore is tantalum-bearing ore.

10 5. The method of claim 1, wherein said tantalum bearing ore is pegmatite, carbonite, apo-granite, alkaline complex, pegmatitic granite, scarn or combinations thereof.

6. The method of claim 1, wherein said at least one copper compound is added in an amount of from about 0.1 to about 5 weight percent based on the weight of the ore.

15 7. The method of claim 1, wherein said at least one copper compound is added in an amount of from about 0.1 to about 1.0 weight percent based on the weight of the ore.

8. A method to control hydrogen sulfide or arsine emissions or both during the digestion of tantalum bearing ore comprising adding at least one copper compound to said tantalum-bearing ore during said digestion.

20 9. The method of claim 8, wherein said digestion occurs by contacting said tantalum-bearing ore with at least one acid.

10. The method of claim 9, wherein said acid comprises HF acid.

11. The method of claim 8, wherein said at least one copper compound is copper oxide.

12. The method of claim 8, wherein said at least one copper compound is CuO,

CuSO₄, or both.

13. The method of claim 8, wherein said at least one copper compound is added prior to the digestion.

14. The method of claim 8, wherein said at least one copper compound is added
5 on a continuous basis to said tantalum-bearing ore during said digestion.

15. The method of claim 8, wherein said at least one copper compound is added batchwise to said tantalum-bearing ore during said digestion.

16. The method of claim 8, wherein said hydrogen sulfide emissions are reduced by 50% compared to digestion where no copper compound is present.

10 17. The method of claim 8, wherein said hydrogen sulfide emissions are reduced by at least 90% compared to digestion wherein no copper compound is used.

18. The method of claim 8, wherein said at least one copper compound is added in a weight ratio of from about 0.5:1 to 2.5:1 (copper compound to sulfur present in ore).

15 19. The method of claim 8, wherein said at least one copper compound is added in an amount of from about 0.1 to about 5 weight percent based on the weight of the ore.

20. A method to control hydrogen sulfide or arsine emissions or both during the processing of material containing sulfur comprising adding at least one copper compound to said material in an amount sufficient to control said emissions.

20 21. The method of claim 20, wherein said material is a valve metal containing ore.

22. The method of claim 20, wherein said at least one copper compound is a copper oxide.

23. The method of claim 20, wherein said at least one copper compound is added to said material during digestion of said material.